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| 09/881,732 | 06/18/2001 | Shogo Fujimori | 1614.1109-CIP | 8751 |

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| EXAMINER | |
|---|---|
| CRAIG, DWIN M | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2123 | |

DATE MAILED: 06/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/881,732 | FUJIMORI ET AL. | |
| | Examiner | Art Unit | |
| | Dwin M. Craig | 2123 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *06 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☒ Claim(s) *17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

**1.** Claims 1-16 have been presented for reconsideration on view of Applicants' Request for Continued Examination (RCE) under 37 CFR § 1.114 and amended claim language.

**1.1** Claims 17 and 18 have been presented for Examination.

### *Response to Arguments*

**2.** Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Objections*

**3.** Claim 17 is objected to because of the following informalities: There are three periods at the end of claim 17, only one period is permitted.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 101*

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

**4.** Claims 1-18 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The current claim language is directed towards an abstract idea and fails to clearly claim a *useful, concrete and tangible result*. For example, claim 1 discloses, *outputting an improvement proposal making the analyzing circuit closer to one of basic types of transmission circuit topologies depending on the analyzing circuit judgment result.* The Examiner notes that the current claim language describes *mental steps* and doesn't result in altering an actual *tangible* circuit. The current claim language fails to modify an actual circuit design because the current method merely provides a *proposal* and fails to modify a *tangible*

circuit. The Examiner further notes that *judging acceptability* is an example of *mental steps* and fails to produce a useful process, a machine, a method of manufacture or a composition of matter as required in 35 USC § 101. The Examiner respectfully suggests that the Applicants' review the claim language in US Patent 5,546,321 Chang et al. as an example of properly claimed statutory subject matter.

Amendment is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**5.** Independent claims 1, 6, 11, 16 and 17 and dependent claims 5, 10, 15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 5,546,321, hereafter referred to as *Chang* in view of *"Performance Driven Global Routing and Wireing Rule Generation for High Speed PCBs and MCMs"* by Sharad Mehrotra, Paul Frazon and Michael Steer, hereafter referred to as *Mehrotra.*

**5.1** As regards independent claim 1, 6, 11, 16 and 17 and using independent claim 1 as an example, *Chang* teaches *a noise determination method for determining noise with respect to analyzing a circuit* (Figure(s) 9 and 11 and Col. 8 lines 35-55 and Col. 13 lines 6-8), *obtaining an analyzing circuit judgment result* (Col. 1 lines 65-67, Col. 2 lines 1-12 and lines 57-67) and *judging acceptability based on a comparison of features* (Figure 9, note in the figure the different features that are provided for comparison, PREVIOUSLY QUALIFIED PRODUCTS, PCB CROSS SECTION DIMENSIONS, DIELECTRIC CONSTANT, the different features that are output as a result of an *acceptability judgment*, CHARACTERISTIC IMPEDANCE, MATCHED LOAD IMPEDANCE, DC RESISTANCE, DRIVER OUTPUT IMPEDANCE, NEAR END BACKWARD COUPLED NOISE, and then note the circle with the words EXPERT SYSTEM, the figure 4 illustrates the different features were *compared* and a *acceptability judgment* is made, further please see Col. 2 line 8, "Expert systems provide judgmental decision making", and Col. 8 lines 63-67).

However, *Chang* does not expressly disclose *a plurality of transmission circuit topologies into which the analyzing circuit is categorized depending in which wirings are connected.*

*Mehrotra* teaches *a plurality of transmission circuit topologies into which the analyzing circuit is categorized depending in which wirings are connected* (Figure 1 and Introduction).

It would have been obvious, to one of ordinary skill in the art, at the time the invention was made to have used the *transmission circuit topologies* teachings of *Mehrotra* in combination with the *noise determining* methods of *Chang* because of the ease with which the methods of *Mehrotra* allow the analysis and design of complex circuit topologies, *see Mehrotra* Introduction.

It is noted by the Examiner that the limitation, *"wherein a transmission waveform of the analyzing circuit differs depending on each of the transmission circuit topologies"* is obvious because, different circuit configurations *"topologies"* will change the waveform of any energy that is injected into the circuit.

It is noted by the Examiner that the limitation, *"outputting an improvement proposal making the analyzing circuit closer to one of the basic types of transmission topologies depending on the analyzing circuit judgment result"* is obvious because *Chang* teaches a GUI (Figure(s) 1, 2, 11 and 13 and Col. 9 lines 1-14), and teaches that there are changes to the circuit based on a judgment result (Figure 4 and Col. 8 line 60 "In the forward mode the design engineer can evaluate alternatives using "what if" analysis with any design parameter, and observe the ripple effect of the change in one or more design parameters on all other parameters.") The

parameters could be *transmission topologies* and the observed ripple effect could be the *changed waveforms*.

Further and regarding that same specific limitation, *"outputting an improvement proposal making the analyzing circuit closer to one of the basic types of transmission topologies depending on the analyzing circuit judgment result."* *Chang* discloses, (Col. 8 line 63, "In the backward mode, the design engineer specifies the performance objectives, and the tool and the method of the invention recommends, *which is the functional equivalent of a proposal*, the design alternatives to satisfy the performance objectives.").

**5.2** As regards dependent claim 18 *Chang* teaches a Printed Circuit Board (PCB) (Title and Col. 5 lines 15-25).

**5.3** As regards the limitation in dependent claims 5, 10 and 15; *"referring to a circuit feature file which stores feature information,"* *Chang* discloses a database containing circuit information (Figure 1) which the functional equivalent of a file which stores *circuit feature information*.

**6.** Claims 2-4, 7-9 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 5,546,321, hereafter referred to as *Chang* in view of *"Performance Driven Global Routing and Wireing Rule Generation for High Speed PCBs and MCMs"* by Sharad Mehrotra, Paul Frazon and Michael Steer, hereafter referred to as *Mehrotra* and in further view of US Patent 5,682,336 hereafter referred to as *Chian*.

**6.1** As regards independent claims 1, 6 and 11 see the rejections in this Office Action.

**6.2** As regards dependent claims 2, 7 and 12, these claims are directed towards treatment of different errors that occur during the circuit analysis; *Chang* teaches dealing with errors or *flaws*

in the design (Figure 4) as well as *"judging acceptability of characteristic values, based on judging values"* ("Col. 2 line 60... The knowledge base contains general information as well as heuristic and judgmental knowledge, including problem solving rules, about the problem domain."

However, neither *Chang* nor *Mehrotra* expressly disclose, *"calculating transmission characteristic values of the analyzing circuit based on calculation formulas depending on the judgement result of said obtaining an analyzing circuit."*

*Chain* discloses, *"Calculating transmission characteristic values of the analyzing circuit based on calculation formulas depending on the judgment result of said obtaining an analyzing circuit."* (Figures 1-5 and *more specifically* Figure 4 and Col. 1 line 48 "Some circuit designers calculate circuit performance to selected noise sources, based upon their experience and knowledge of previous designs"), *it is noted by the Examiner that the process of acquiring the past experience of experts is expressly disclosed in Figure 1 of Chang, note the black oval with the label "EXPERT'S BRAIN".*

It would have been obvious, to one of ordinary skill in the art, at the time the invention was made, to have used the *waveform analysis* methods of *Chain* in combination with the *Judgmental knowledge* methods of *Chang* and the *circuit topology* methods of *Mehrotra* in combination because, *Chain* discloses the use of an experts knowledge of a previous design (Col. 1 line 48), and *Chang* discloses using that type of expert knowledge in an expert system (*Chang* Figure 1 and Col. 1 lines 48-52 and Col. 2 lines 35-47).

As regards the limitation, *calculating transmission characteristic values of the analyzing circuit based on the calculation formulas depending on the judgment result of said obtaining an*

*analyzing circuit judgment and the transmission circuit topologies. Chang* teaches *obtaining an analyzing circuit judgment based on analyzing a circuit* (Figure 9).

However, *Chang* does not expressly disclose *calculating transmission characteristic values of the analyzing circuit based on the calculation formulas.*

*Chian* teaches, *calculating transmission characteristic values of the analyzing circuit based on the calculation formulas* (Figures 1-5 and Col. 5 lines 14-63).

It would have been obvious, to one of ordinary skill in the art, at the time the invention was made, to have combined the teachings of *Chian* with the teachings of *Chang* because, there is the need to ensure that the a circuit will perform within the required noise performance criteria before expensive fabrication takes place (*Chian* Col. 2 lines 43-46).

As regards the limitation of *selecting and outputting an improvement proposal by referring to an improvement proposal file which indicates improvement proposals depending on error causes, using error cause analysis by said analyzing an error cause, Chang* teaches (Figure 11 "PRINT RESULTS" and Figure 13 and Col. 14 lines 33-67 and Col. 15 lines 1-58).

**6.3** As regards the limitation in dependent claims 3, 4, 8, 9, 13 and 14 *"analyzing the transmission waveform of the analyzing waveform analyzing tool"* neither *Chang* nor *Mehrotra* expressly disclose a *waveform-analyzing tool.*

*Chian* discloses a *waveform-analyzing tool* (Col. 2 lines 66-67 and Col. 3 lines 1-25).

As regards the limitation, *analyzing the error cause by referring to the error cause file* see *Chang* (Figure 11 "PRINT RESULTS" and Figure 13 and Col. 14 lines 33-67 and Col. 15 lines 1-58).

As regards the limitation, *selecting and outputting* "printing" *an improvement proposal by referring to an improvement proposal file which indicates improvement proposals depending on error causes, using the error cause analyzed by said analyzing the error cause, Chang* teaches (Figure 11 PRINTING RESULTS, and note the box which states SPECIFY GOALS the Examiner notes that if the design fails to comply with the SPECIFIED GOALS then an indication will be provided in the RESULTS that are PRINTED OUT *see* Col. 8 lines 58-67 and Col. 16 lines 26-67 and Col. 17 lines 1-32).

***Conclusion***

**7.** Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwin M. Craig whose telephone number is (571) 272-3710. The examiner can normally be reached on 10:00 - 6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul L. Rodriguez can be reached on (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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